

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims**

**Claim 1 (Currently Amended)** A device for separating at least one compound from a mixture by adsorption with a simulated moving bed, comprising at least:

an enclosure or column comprising adsorbent beds ( $A_i$ ), at least two adsorbent beds being separated by at least one fluid distribution and extraction plate ( $P_i$ ), the plate comprising one or more panels allowing distribution, mixing and/or extraction of fluids, at least one panel comprising a single distribution, mixing and/or extraction chamber ( $C_i$ ),

a plurality of lines (10, 11, 12, 13,  $T_i$ ) for extraction or injection of secondary fluids,

a bypass circuit communicating a distribution plate with at least one bypass line ( $L_{i,j}$ ), wherein

the device comprises means (14,  $V_{oi,j}$ , 20) for communicating said at least one single distribution, mixing and/or extraction chamber ( $C_i$ ) with at least one bypass line ( $L_{i,j}$ ),

at least one end of said at least one bypass line communicates with a zone ( $R_i$ ,  $R'_i$ ) of an adsorbent bed, said zone being distinct from any distribution chamber ~~chambers~~ ( $C_i$ ), and another end of said at least one bypass line is connected to a chamber ( $C_i$ ).

**Claim 2 (Currently Amended)** A device as claimed in claim 1, wherein ~~characterized in that~~ said means for communicating ( $C_i$ ) with ( $L_{i,j}$ ) comprises at least one valve ( $V_{oi,j}$ ) arranged on at least one bypass line ( $L_{i,j}$ ) and in that an end of the bypass line that is not connected to the zone of the adsorbent bed is connected to a delivery and/or extraction line ( $T_i$ ), which line ( $T_i$ ) is connected to chamber ( $C_i$ ).

**Claim 3 (Currently Amended)** A device as claimed in claim 1, wherein

~~characterized in that~~ said means for communicating (Ci) with (Li,j) comprises at least one rotary valve (20), said rotary valve being connected to at least one delivery and/or extraction line (Ti) and to at least one bypass line (Li,j), said valve comprising means allowing at least to communicate a delivery and/or extraction line with at least one bypass line.

**Claim 4 (Currently Amended)** A device as claimed in claim 3, wherein ~~characterized in that~~ said rotary valve (20) is in communication with a plurality of groups of lines, group G<sub>1</sub>, group G<sub>2</sub> and group G<sub>3</sub>, said valve comprising:

- a stator (110) provided with several means (E, F, R, S) for circulation of a fluid(s) of a group G<sub>1</sub>, means (115, 116) allowing passage of at least two fluids F<sub>1</sub>, F<sub>2</sub> belonging to group G<sub>3</sub>, said means (115, 116) comprising a substantially equal number of passages, means (115) having a flow section S<sub>1</sub>, means (116), having a flow section S<sub>2</sub>, different from S<sub>1</sub>,
- a rotor (117) equipped with means (119) for passage of fluids of a group G<sub>3</sub> and means (120) for communication of either the fluids of group G<sub>1</sub> with group G<sub>3</sub>, or of group G<sub>3</sub> with group G<sub>3</sub>, and
- means (122) for communicating at least two fluids of group G<sub>3</sub>.

**Claim 5 (Previously Presented)** A device as claimed in claim 4, wherein the means for passage of fluid F<sub>1</sub> and of fluid F<sub>2</sub> have flow sections S<sub>1</sub> and S<sub>2</sub> respectively, wherein S<sub>1</sub>/S<sub>2</sub> ratio is 2 to 10.

**Claim 6 (Previously Presented)** A device as claimed in claim 4, said means communication of fluids of group G<sub>3</sub> consists of slots (122) provided in a layer of material or liner deposited on the lower face of the rotor.

**Claim 7 (Currently Amended)** A device as claimed in claim 6, wherein ~~characterized in that~~ a slot (122) has a depth at least equal to the thickness of the liner.

**Claim 8 (Previously Presented)** A device as claimed in claim 6, wherein said

circulation means (E, R, S, F) comprises a plurality of grooves arranged on an upper face of the stator and slots (122) are provided in the liner.

**Claim 9 (Previously Presented)** A device as claimed in claim 4, wherein circulation means (E, R, S, F) are 4 in number.

**Claim 10 (Previously Presented)** A device as claimed in claim 1, wherein said enclosure comprises a non-perforated central tube over at least part of the length thereof, and in the panels forming a plate comprise a tangential cutout; and wherein zone (R<sub>i</sub>, R'<sub>i</sub>) comprises at least one diverted fluid distribution means (53, 54), and the end of bypass line (L<sub>i,j</sub>) connected to chamber (C<sub>i</sub>) opens into said diverted fluid distribution means (53, 54).

**Claim 11 (Previously Presented)** A device as claimed in claim 10, wherein a fluid distribution circuit is arranged around said enclosure and comprises a main line (61) divided into a plurality of secondary lines (62, 63, 62a, 62b) so that the fluid(s) reach the panels forming a plate substantially at the same time.

**Claim 12 (Previously Presented)** A device as claimed in claim 10, wherein the plates form a parallel cutout and in that the fluid distribution circuit comprises a main line, and a bypass line connected to an adsorbent bed by means of a device comprising transfer ports.

**Claim 13 (Previously Presented)** A device as claimed in claim 1, wherein a plate is delimited by a lower grid (6) and an upper grid (7) and in that an end of the bypass line connected to the adsorbent bed is connected to a distribution means (30) arranged above said upper grid.

**Claim 14 (Previously Presented)** A device as claimed in claim 1, wherein a plate comprises a plurality of panels forming a radial cutout, the enclosure comprises a central tube and a secondary fluid distribution ring in communication with a distribution plate, and a diverted

fluid distribution means, said means being arranged below the distribution ring and said means being connected to the end of the bypass line, said bypass line being connected to a zone of an adsorbent bed.

**Claim 15 (Previously Presented)** A device as claimed in claim 14, wherein said diverted fluid distribution means comprise at least one diverted fluid distribution ring (53), said ring (53) being arranged in a perforated means (55), said means having a substantially conical shape.

**Claim 16 (Previously Presented)** A device as claimed in claim 10, wherein said perforated means comprises a wall (55) forming an angle  $\alpha$  with the central tube and in that said ring (53) is located at a distance  $a$  from said grid.

**Claim 17 (Currently Amended)** A device as claimed in claim 1, wherein said column comprises a substantially central mast comprising one or more mast elements (80), including at least:

- an upper part (81),
- A distributor-collector part (82) comprising one or more secondary ports (86i) and at least one main port (85), the flow sections of ports (85) and (86i) being different,
- a lower part (83)
- a distributor-collector part(s) (82) are arranged between an upper part (81) and a lower part (83)
- a sealing element (84a) arranged between distributor-collector part (82) and lower part (83),
- a separation element (87) arranged on distributor-collector part (82), thus delimiting two fluid circulation spaces (82a, 82b).

**Claim 18 (Currently Amended)** In a process comprising injection of a diverted fluid in a simulated moving bed separation process, comprising at least the following stages:

circulating a main fluid through a plurality of adsorbent beds in an enclosure,  
injecting and extracting secondary fluids comprising feed, desorbent, extract  
and/or raffinate according to a sequential order to achieve separation of the constituents of the  
feed,

injecting a diverted fluid,  
the improvement wherein at least part of the main fluid is circulated outside the enclosure  
allowing separation by means of a bypass line comprising at least two ends, one end being  
connected to a zone of an adsorbent bed distinct from distribution chambers  $(C_i)$ , so as to inject  
and/or to extract part of the main fluid in the zone.

**Claim 19 (Canceled)**

**Claim 20 (Currently Amended)** A process as claimed in claim 18, wherein a fraction  
of the main fluid is drawn off from a zone of an adsorbent bed  $A_i$  and said fraction is injected  
into a chamber  $C_i$ .

**Claim 21 (Previously Presented)** A process as claimed in claim 18, wherein  
paraxylene is separated from aromatic hydrocarbon-containing feeds with eight carbon atoms.

**Claim 22 (Previously Presented)** A device according to claim 5, wherein the  $S_1/S_2$   
ratio is about 4.

**Claim 23 (Canceled)**

**Claim 24 (Previously Presented)** A device according to claim 1, comprising at least  
one bypass line  $L_{i,j}$  with  $j=i+1$ , in which a fluid is diverted from a chamber  $(C_i)$  to a zone  $(R_{i+1})$ .

**Claim 25 (Previously Presented)** A process as claimed in claim 18, wherein a fraction of the main fluid is drawn off from a chamber ( $C_i$ ) corresponding to a plate  $P_i$  and the main fluid fraction drawn off is injected into a zone of adsorbent bed  $A_{i+1}$ .

**Claim 26 (New)** A device for separating at least one compound from a mixture by adsorption with a simulated moving bed, comprising at least:

an enclosure or column comprising adsorbent beds ( $A_i$ ), at least two adsorbent beds being separated by at least one fluid distribution and extraction plate ( $P_i$ ), the plate comprising one or more panels allowing distribution, mixing and/or extraction of fluids, each panel comprising a single distribution, mixing and/or extraction chamber ( $C_i$ ),

a plurality of lines (10, 11, 12, 13,  $T_i$ ) for extraction or injection of secondary fluids,

a bypass circuit communicating a distribution plate with at least one bypass line ( $L_{i,j}$ ), wherein

the device comprises means (14,  $V_{oi,j}$ , 20) for communicating said at least one single distribution, mixing and/or extraction chamber ( $C_i$ ) with at least one bypass line ( $L_{i,j}$ ),

at least one end of said at least one bypass line communicates with a zone ( $R_i$ ,  $R'_i$ ) of an adsorbent bed, said zone being distinct from any distribution chamber, and another end of said at least one bypass line is connected to chamber ( $C_i$ ).